AECOM
750 Corporate Woods Parkway
Vernon Hills, IL 60061

847-279-2500 tel
847-279-2510 fax

May 5, 2010

Mr. Steve J. Faryan, On Scene Coordinator
USEPA Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Subject: EPA Docket No. RCRA 7003-5-08-001
Mallard Lake Landfill, Hanover Park, Illinois
AECOM Project No. 60151902.2400

Dear Mr. Faryan:

Pursuant to USEPA request during the April 22, 2010 site status meeting, AECOM staff conducted a purge test at temporary gas monitoring probe ML-08i located directly west of Greenbrook Elementary School. Probe ML-08i is screened from approximately 20.1 ft to 39.7 ft below ground surface (elevation 751.6-771.2 ft MSL) with the potentiometric surface approximately 33 ft to 34 ft below ground surface (elevation 756.8-757.8 ft MSL). The boring log from ML-08i indicates that the W1/W2 unit exists between approximately 37 and 39 ft below ground surface (elevation 752-754 ft MSL).

The test at probe ML-08i was conducted by purging the sealed headspace of the probe with a Landtec GEM500 for approximately 10 minutes, evacuating the headspace of the probe for 10 minutes, and then purging the re-sealed probe for 10 minutes. The duration of the test was determined based on approximately one headspace volume being purged from the at the average flow rate of the GEM500 (0.30 liters per minute: LPM). As shown in Table 1, methane concentrations at probe ML-08i decreased from 74.8% to 62.0% by volume during the course of the initial 10 minute purge. The headspace of the probe was then unsealed and the headspace evacuated by pumping atmospheric air approximately 30 ft down into the probe through tubing connected to the GEM500 exhaust for 10 minutes. Probe ML-08i was then re-sealed and purged with the GEM500 for an additional 10 minutes. Methane concentrations detected subsequent to the evacuation of the headspace ranged from 46.7% to 42.0% by volume. As shown in Table 1, the data indicate that after the GEM500 was reconnected to probe ML-08i, methane concentrations decreased from 46.7% to 42.0% in the first 6 minutes of the purge. During the final 4 minutes of purging methane concentrations increased from 42.0% to 44.0% by volume.

Based on comments by Mr. Walter Nied of USEPA during a phone call on April 23, 2010 with Mr. Matt Weiss of AECOM, AECOM conducted a second test at ML-08I on April 27, 2010 using similar methodology. However, the second test was conducted until approximately three headspace volumes of air were purged from the probe (approximately 30 minutes). During each of the tests conducted on April 27, 2010, the exhaust rate of the GEM500 was measured in line with a flow meter at approximately 0.3 LPM. Subsequent to the initial purge while the probe was sealed, the probe was unsealed and purged with atmospheric air for 20 minutes. Atmospheric air was pumped

approximately 30 feet down into the probe via tubing connected to the GEM500 exhaust. Similar to the April 23, 2010 test, a second round of purging was conducted at probe ML-08I approximately 10 minutes after it was re-sealed. A summary of the data collected during the April 27, 2010 test is presented in Table 2.

As shown in Table 2, methane concentrations at probe ML-08i decreased from 64.7% to 56.2% by volume during the initial 30 minute purge and then increased from 37.2% to 54.7% by volume at the end of the second 30 minute purge. Methane concentrations measured approximately 3 hours after the purge test was completed at probe ML-08i indicated concentrations ranging from 67.7% to 77.0% by volume.

This data suggests that the gas composition within probe ML-08i is relatively stable at 74% to 77% methane by volume and 21% to 22% carbon dioxide by volume. The data also suggest that the only significant influence on methane concentrations in the headspace of the probe is the introduction of atmospheric air into the probe. This is demonstrated by the increasing oxygen content measured during the initial tests conducted on April 23 and 27, 2010 and maximum oxygen content measured immediately after the headspace of the probe was evacuated with atmospheric air. Measurements of highest oxygen content typically corresponded to the lowest methane concentrations during each individual test.

Based on the low flow rates and small negative pressures detected during the test conducted on April 27, 2010, AECOM believes that atmospheric air may have been introduced to the probe through the surface fittings. These observations are consistent with nitrogen injection testing conducted on October 14, 2009, that indicated the flow rate of nitrogen injected into the probe dropped from approximately 15 cubic feet per hour (CFH) to approximately 3 CFH after 1 minute of injection (refer to Table 3). The drop in injection flow into the probe over such short time periods indicates that the air within the headspace of the probe is stagnant and that the injected air is likely leaking through the surface fittings. In order to verify the injection results are consistent for extraction at higher vacuums AECOM proposes running a mobile oxidation unit at probe ML-08i for approximately 2 hours. The mobile oxidation unit will be operated in a manner that allows the applied vacuum to be adjusted based on suspected leakage conditions (i.e. oxygen content) detected in the probe.

Please feel free to contact the undersigned at 847.279.2500 if you have any questions or concerns.

Sincerely,

Matt Weiss
Staff Hydrogeologist

Michael Ruetten
Principal Engineer

cc: Jacob Hassan – US Environmental Protection Agency
Joseph Benedict – Forest Preserve District of DuPage County
Jim Hitzeroth – Mallard Lake Landfill
Tom Rivera – Illinois Environmental Protection Agency

Table 1
Summary of ML-08I Purge Test Results
April 23, 2010
Mallard Lake Landfill
AECOM Project No. 60151902.2400

Probe	Date	Static Pressure (inches H2O)	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Balance Gas (%)	Depth to Water (bMV)	Elevation of Groundwater Surface (ft MSL)	Qualifier
ML-08I	4/23/10 10:24 AM	4.4	74.8	21.9	0.0	2.3	NM	NM	Initial readings, 1 minute interval test
ML-08I	4/23/10 10:25 AM	NM	70.6	20.4	0.6	8.4	NM	NM	
ML-08I	4/23/10 10:26 AM	NM	67.7	19.5	1.3	11.5	NM	NM	
ML-08I	4/23/10 10:27 AM	NM	66.3	19.1	1.6	13.0	NM	NM	
ML-08I	4/23/10 10:28 AM	NM	64.5	18.7	2.0	14.8	NM	NM	
ML-08I	4/23/10 10:29 AM	NM	63.7	18.5	2.3	15.5	NM	NM	
ML-08I	4/23/10 10:30 AM	NM	63.0	18.3	2.4	16.3	NM	NM	
ML-08I	4/23/10 10:31 AM	NM	62.4	18.2	2.5	16.9	NM	NM	
ML-08I	4/23/10 10:32 AM	NM	62.0	18.2	2.5	17.3	NM	NM	
ML-08I	4/23/10 10:33 AM	NM	62.0	18.2	2.5	17.3	NM	NM	
ML-08I	4/23/10 10:34 AM	NM	62.0	18.1	2.7	17.2	33.90	756.91	
ML-08I	4/23/10 10:37 AM	NM	NM	NM	NM	NM	NM	NM	Start 10 minute purge with GEM
ML-08I	4/23/10 10:47 AM	NM	NM	NM	NM	NM	33.90	756.91	
ML-08I	4/23/10 10:57 AM	4.4	46.7	14.7	6.0	32.6	NM	NM	Waited 10 minutes after purge, start 1 minute interval again
ML-08I	4/23/10 10:58 AM	NM	45.7	14.8	6.2	33.3	NM	NM	
ML-08I	4/23/10 10:59 AM	NM	43.4	14.4	6.8	35.4	NM	NM	
ML-08I	4/23/10 11:00 AM	NM	42.4	14.2	7.0	36.4	NM	NM	
ML-08I	4/23/10 11:01 AM	NM	42.2	14.2	7.2	36.4	NM	NM	
ML-08I	4/23/10 11:02 AM	NM	42.0	14.2	7.2	36.6	NM	NM	
ML-08I	4/23/10 11:03 AM	NM	42.0	14.2	7.2	36.6	NM	NM	
ML-08I	4/23/10 11:04 AM	NM	42.2	14.2	7.2	36.4	NM	NM	
ML-08I	4/23/10 11:05 AM	NM	42.7	14.3	6.9	36.1	NM	NM	
ML-08I	4/23/10 11:06 AM	NM	43.3	14.3	6.8	35.6	NM	NM	
ML-08I	4/23/10 11:07 AM	NM	44.0	14.5	6.5	35.0	33.80	757.01	Final reading

Table 2
Summary of ML-08I Purge Test Results
April 27, 2010
Mallard Lake Landfill
AECOM Project No. 60151902.2400

Probe	Date	Static Pressure (inches H2O)	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Balance Gas (%)	Depth to Water (bMV)	Elevation of Groundwater Surface (ft MSL)	Qualifier
ML-08I	4/27/10 10:25	2.0	64.7	17.3	3.4	14.6	NM	NM	Initial readings, 3 minute test
ML-08I	4/27/10 10:30	2.0	65.5	17.2	3.7	13.6	NM	NM	
ML-08I	4/27/10 10:35	NM	60.1	16.3	4.5	19.1	NM	NM	
ML-08I	4/27/10 10:40	NM	57.7	15.7	5.0	21.6	NM	NM	
ML-08I	4/27/10 10:45	NM	56.0	15.2	5.5	23.3	NM	NM	
ML-08I	4/27/10 10:50	NM	56.1	15.2	5.3	23.4	NM	NM	
ML-08I	4/27/10 10:55	NM	56.5	15.5	5.2	22.8	NM	NM	
ML-08I	4/27/10 11:00	NM	56.2	15.4	5.3	23.1	33.30	757.51	
ML-08I	4/27/10 11:05	NM	NM	NM	NM	NM	NM	NM	Start 20 min purge of headspace with GEM exhaust
ML-08I	4/27/10 11:25	NM	NM	NM	NM	NM	33.25	757.56	
ML-08I	4/27/10 11:35	6.0	37.2	11.6	9.9	41.3	NM	NM	Waited 10 minutes after purge, start 1 minute interval again
ML-08I	4/27/10 11:40	NM	35.4	11.4	10.4	42.8	NM	NM	
ML-08I	4/27/10 11:45	NM	36.7	11.5	10.0	41.8	NM	NM	
ML-08I	4/27/10 11:50	NM	41.4	12.4	8.9	37.3	NM	NM	
ML-08I	4/27/10 11:55	NM	45.1	12.8	7.9	34.2	NM	NM	
ML-08I	4/27/10 12:00	NM	49.4	13.3	7.0	30.3	NM	NM	
ML-08I	4/27/10 12:05	NM	57.0	15.2	4.9	22.9	NM	NM	
ML-08I	4/27/10 12:10	NM	54.7	14.4	5.4	25.5	33.40	757.41	
ML-08I	4/27/10 15:00	2.8	77.0	21.7	0.0	1.3	NM	NM	
ML-08I	4/27/10 15:03	NM	67.7	10.8	1.9	19.6	NM	NM	

Table 3
Summary of ML-08I Nitrogen Injection Test Results
Mallard Lake Landfill
AECOM Project No. 60151902.2400

Probe	Date	Gas Composition/Water level	Initial	Final	Nitrogen Intake Test Summary			
ML-08i	10/14/2009	Time	12:03	12:18	Time	Flow (SCFH)	Pressure (in H_2O)	Nitrogen Tank Valve Setting
		Static Pressure (in H_20)	4.7	5.4	12:03	N/A	40	Pressurize system
		CH_4	77.5	77.5	12:04	15	40	Initial setting
		CO_2 (%)	21.4	21.4	12:05	3	40	Same
		O_2 (%)	0.1	0.1	12:10	3	40	Same
		Balance (%)	1.0	1.0	12:15	3	40	Same
		Depth to Water (ft)	NM	NM	12:18	3	40	Depressurize system
		Screen Interval (ft bgs)	20.1-39.7					